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With The Editor

Chemicals Are Complicated

THE use of chemical fertilizers is such a complicated procedure that many do not have the experience to handle them properly. The result is that they follow hit-or-miss methods which are far from scientific. Some think that if a small amount of chemical fertilizers is good, then a lot is better. This ends up disastrously in many cases. An acquaintance of mine a few years ago bought a bag of a popular brand of chemical fertilizer for his flower garden. He carefully followed the directions as to the proper quantity to use. When he had finished, he found he had used only half the bag. He decided to use up the remainder in order to get it out of the way. The result was that he burned up many plants. He doesn't use chemical fertilizers anymore.

Many gardeners use too much chemical fertilizers due to a lack of knowledge of the make-up of these strong chemicals. In "North-West Gardens" (June, 1944 issue) there is a warning which is given herewith, "Because commercial fertilizers are so highly concentrated, they must not be allowed to come in contact with the plant, so the trench is dug from two to four inches away from the stems. Also, care must be taken to remove immediately any that may be spilled on the leaves, for if allowed to remain, burning may result. Many gardeners do not realize the potentcy of commercial fertilizers and use far too much. This is both dangerous and wasteful; dangerous because roots can be burned by large amounts not properly blended with the soil, and wasteful because plants can only take up so much food at a time, and when too heavy an application of fertilizer is made, a large portion leaches away before the plants can use it. It is far better to apply small amounts more often."

An extremely common artificial fertilizer, and yet, one which requires a great deal of expertness in using is nitrate of soda. H. R. Ely in "The Practical Flower Garden" (Macmillan) says, "Then there is nitrate of soda, which does not stimulate root-growth, but is valuable in producing rapid increase in bloom and tends to give more brilliant coloring to the blossoms. This product should be regarded, however, as a quickening tonic, for use somewhat as nitro-glycerine is prescribed by the medical profession.

"No fertilizer will produce such quick results as nitrate of soda if

properly used, but, if used too freely, probably no other fertilizer can damage the plants so quickly". This is a very common fertilizer.

Nature is an experienced soil chemist. She works deftly and harmoniously. She mixes her brews with an experience stemming from a background of millions of years. Say what you will, man rarely figures out his discoveries from a preconceived theoretical plan. They result either by accident or by trial-and-error. Nature went through the trial-and-error stage millions of years ago. Man is still in the swaddling clothes of trial-and-error. His use of chemistry in farming is just one example of his method of applying his "science". He is floundering about in a chemical sea of uncertainty.

He throws an excess of potassium in the soil and is not aware that this precipitates the soil magnesium. Magnesium is badly needed, lack of it causing diseases in rye and oats. In Alabama it was found that on certain clay soils the application of phosphates caused iron chlorosis. He sprays the soil and unknowingly there accumulates in that soil, arsenic, copper, lead and zinc which after awhile prevents even cover crops in orchards from growing. Trial-and-error, but mostly error.

There are too many conditions hedging about the use of chemical fertilizers. One authority says that the fertilizer should not be applied too heavy in a dry year. How is one to know it is going to be a dry year? A heavy fertilizer application in such a year makes the plant grow too rapidly. It will be too stemmy and will ripen too fast.

Experiments show that the young seed cannot tolerate too much chemical fertilizers. After the seed has grown somewhat it can tolerate a higher concentration. Methods have been evolved where machines apply the fertilizers in bands away from the seeds where the plant can get at it later, but results are sometimes erratic. Trouble is encountered also over the fact that there are accumulated residues from previous chemical applications which affect plants at the seedling stage.

Here is a statement from a publication issued by the N. Y. State Agr. Exp. Station at Geneva, N. Y., "Some fertilizers are very toxic and inhibit root growth, while others stimulate root development. Some fertilizers are quite inert, some are slow-acting, and others dissolve quickly and give immediate growth response".

A reader asks his gardening magazine for advice. His tomato plants grow tall without ripening fruit. He is told that his soil contains too much nitrogen and not enough phosphorus. So he will go hard on the phosphorus. Next year his plants will suffer from symptoms of an oversupply of phosphorus. The fact of the matter is that there is no one formula for tomatoes. In the April 1944 issue of Farm Research, a Cornell University publication, it states, "In fertilizer experiments with cannery tomatoes it has been demonstrated that no one formula can be recommended for all soils. The highest yields were obtained from the highest nitrogen ratio on Ontario loam at Geneva, from the highest amount of phosphorus on Fulton silty clay at Fredonia, and from the heaviest potash application on Palmyra gravelly loam at Marion".

Prof. Charles E. Kellogg in "The Soils That Support Us" (Macmillan) shows how overzealous fertilizer salesmen sometimes think more of making a sale than the satisfaction of the exact requirements of the farmer. He says, "One very bad feature of the emphasis upon complete fertilizers is that farmers are

often persuaded to use them on soils that need only one or two elements, thus unnecessarily increasing their fertilizer bills. Perhaps there is more profit to the manufacturer in selling complete fertilizers, containing nitrogen, phosphorus, and potassium, as compared to straight goods, a fertilizer containing only one primary element. Just because some soils need all three is no reason for putting them on all soils. This is especially true with soils needing only phosphatic fertilizers. It is hoped that fertilizer salesmen and others will give more emphasis to what is needed to supplement the soil, rather than attempting a "shot-gun dosage for a whole group of soils".

Basic slag is a strong material which shows results mainly on heavy pastures. It is worthless on limestone lands. There are dozens of other special conditions and hedges surrounding the use of chemical fertilizers. A farmer would have to be an expert chemist to handle them even halfway near to the best way to get maximum results. And some farmers who get results with chemicals are tempted to throw stable manures overboard, to farm without livestock, a 100% chemicalized farming procedure which can only cause disastrous consequences in the end.

In "Science and Appliance" (June 1944) published by the Ohio State University Research Foundation there is some remarkable comment on a pamphlet, entitled *Our Heritage, the Soil*, published by Ohio State University, in 1936. It follows, "This pamphlet, entitled *Our Heritage, the Soil*, was written by three members of the department of agronomy at the Ohio State University. In a careful, mathematical fashion, the authors considered the productivity of the soil as indicated by agricultural statistics of Ohio over a period of sixty years. They came to the shocking conclusion that, although superficially we appeared to be reaping larger returns per acre at the end of the period than at the beginning, the increase in productivity had not been nearly so great as might have been expected. We were farming better, and not getting a great deal more. To make the matter appear much more alarming, in the interval some of the poorest lands had been retired.

"The situation, as stated simply, is serious. The permanent value of the soil appears to have been impaired. The land may be stimulated to produce fairly good yields, but the stimulation is only temporary. The capital itself has deteriorated.

"It is not on fertility alone that the soil has suffered. Its tilth or working character has suffered. Lands have been reported as much heavier and more compact than formerly, harder to drain and more liable to bake to bricklike solidity.

"The situation is summed up in this fashion: The natural productive capacity of the land has been deteriorating at a rate almost fast enough to offset all of the improvements in soil and crop management."

There is today a strong back-to-the-land movement. People are going on farms who know absolutely nothing about agriculture. How simple it would be if they embraced the organic method. To use the vernacular, it would be a cinch for them. They would require very few tests, no complicated chemistry, no scientific training but simply the one-track idea of loading organic matter, humus into the soil as in a savings bank and to keep increasing their balance from year to year.

J. I. RODALE.

The Stability of The Variety

By SIR ALBERT HOWARD, C. I. E.

IN the March issue of the *Guild Gardener* (p. 2) a brief reference was made to two difficulties which in recent years have arisen in this country in the cultivation of the potato. These troubles are: (1) an increasing tendency for the variety to run out—in other words, to lose the power to reproduce itself, and (2) the growing toll taken by diseases like blight, eelworm, and virus. Two cases were cited in which, by means of organic manuring, these difficulties had been avoided. The note concluded with the suggestion that an explanation of both these weaknesses could be found in a study of the nitrogen cycle and that in all probability they arose through the substitution of artificials like sulphate of ammonia for properly made humus.

After this article appeared in print it occurred to me that a still more striking example of the connection between organic manuring and the stability of the variety might be provided by the cultivation of this crop in Tristan da Cunha, that lonely island in the South Atlantic rarely visited by ships, where artificial manures and poison sprays are unknown and where frequent changes in the variety of potato are out of the question.

Accordingly a letter was addressed to Major Irving B. Gane, the Secretary of the Tristan da Cunha Fund, at 2 Temple Gardens, London, E. C. 4, asking if he could supply any information bearing on the cultivation of the potato, the methods of manuring in use, and whether any new varieties of potato had been sent out in the shipments of stores from this country.

Major Gane has, in a letter dated March 15th 1945, very kindly furnished me with the following interesting details which I am permitted to publish:

'(1) The soil was spoken of some sixty years ago as having great fertility. The Island, of course, is volcanic in nature, the cultivable area being quite small. As you rightly surmise, the islanders use seaweed. A belt of thick kelp extends round the Island some 400-500 yards from the shore, and rough seas wash large quantities on to the beaches. This is collected by the Islanders and used for their potato patches. I suspect, however, that the islanders may also use guano, of which there are very large deposits on the uninhabited islands in the group, Inaccessible and Nightingale Islands, but I have no definite evidence as to this. It is also possible that a certain amount of dung may be used, as there are some island cattle. This seems to me, however, to be unlikely as the cattle run loose, and it must also be remembered that there is no straw, in that no cereal crops are grown. There is an island fern which grows in profusion, and possibly if any cattle are kept in buildings, the leaves of this may be used as bedding, but this, I am afraid, is all guesswork on my part.

'(2) I am satisfied that the islanders have no means of changing the variety of the potatoes grown, and it would be safe to assume that the seed has been retained from year to year during the hundred

years or so of the Island's occupation. In this connection I attach a copy of the only reference I have been able to find on the matter from the book of Mrs. Rose Rogers, *The Lonely Island,* published by Messrs. George Allen & Unwin Ltd. This reads as follows:— "The potatoes are first dug up, laid in the sun to dry, then sorted into four classes—eating potatoes and large ones, first and second seeds, and big potatoes or the very small ones. The next process is packing all into different sacks. They are loaded into the bullock wagons and brought home and unloaded into the potato sheds, all in separate bins and according to quality."

'I, and my father before me, organized the despatch of stores to the Island, and although we have sometimes included supplies of vegetable seeds, we have certainly never sent out any seed potatoes.

'(3) Every now and then there is a failure of the potato crop, which is a serious matter, and although the risk of actual starvation does not exist, the islanders are more or less with their backs to the wall when the potato crop fails. I have no information as to the precise cause of the failure. Fortunately it does not seem to occur very often.

'In view of the interest you have displayed in the matter, I have taken a note to obtain much more detailed information as to the cultivation of potatoes on the Island when communication becomes once more possible.'

Here we have an example of organic manuring pure and simple which has been followed by no loss of reproductive power such as occurs in this country, otherwise it would not have been possible for the same variety of potato in Tristan to have lasted so long.

What a different state of affairs is to be found in the great potato areas of Great Britain, where a change of seed is necessary every three years or so and where frequent sprayings and dustings with copper salts are needed to keep blight at bay!

This Tristan experience with the potato closely follows that of the cultivation of the vine in Central Asia and of the thin indigenous sugar-cane varieties of the United Provinces of India. In both these crops organic manuring only is practised; chemical manures are unknown; the varieties grown have not been changed for many centuries; diseases are negligible. But when these two crops are grown by the methods of the Occident and organic manuring is largely replaced by chemicals, the stability of the variety is soon lost; a stream of new varieties has to be created by the plant-breeders, and the inroads of disease increase very markedly as the years pass.

In the case of the sugar-cane crop in the island of Barbados in the West Indies we have records of the effect on the variety of the change in manuring. Till the last decades of the nineteenth century organic manuring only was practised: the variety of cane grown was the Bourbon—a type with a rich juice easily converted into muscovado sugar, which had been successfully cultivated for a very long time. But when artificials began to replace farmyard manure (locally known as pen manure) the rind disease (a fungous trouble) developed with such speed that the old Bourbon had to be given up and new seedling canes had to be produced to take its place. These, however, lasted but a few years and then had to be replaced by others. The history of recent cane cultivation in this island is a record of the replacement of one new cane after another.

The same thing happened with

the vine in countries like France and Germany as soon as there was insufficient organic manure for the vast areas put under this crop. Diseases of various kinds made their appearance and drastic changes in the management of the crop had to be made. The *Phylloxera* epidemic at the end of the last century was the first writing on the wall. New stocks had to be imported from the United States of America: new varieties of vine had to be created: nowadays the vines have to be plastered every spring with copper salts to keep pests at bay: before the war spraying during the growing period was compulsory. In at least one area—the Camargue in the Department of Bouches du Rhône—the grapes raised by means of artificial manures have lost quality to such an extent that they can no longer be made into wine, but have to be converted into alcohol for diluting the petrol used in motor cars.

The loss of the power of plants (raised with chemicals) to reproduce themselves is not confined to cases of vegetative reproduction like the potato, the vine, and the sugar-cane. Plants grown from seed are also affected. One of the characteristics of present-day horticulture is the way varieties of crops run out. But in Nature's farming, as seen in the hedgerows of this country, the wildings grow from seed from year to year for centuries without any loss of reproductive power and with ample disease resistance to keep pests at bay.

An interesting question arises at this point. If artificial manures destroy the power of the plant to reproduce itself, how does such produce affect the people who have to consume it? Does their ability to reproduce the species suffer? If it does, then one of the causes of race suicide can be traced to the manure bag.

I suggest that readers of this journal should always copy the methods of the islanders of Tristan da Cunha in producing their seed potatoes and also in the seeds of the flowers and vegetables they grow. An increasing number of my correspondents are doing so with highly successful results. What is needed at the moment are examples without end of effective seed-growing duly recorded in some journal such as this. In this way useful material will be provided for the horticultural reformers of to-morrow.

Soil Organic Matter

"A DECLINE in organic matter does not produce a sudden or drastic reduction in yield but is responsible for poorer soil tilth, diminishing permeability, and possibly decreased availability of certain nutrients," says Professor F. G. Merkle of the Pennsylvania Experiment Station. He adds: "In greenhouse and potting soils, a high content of organic matter is essential in order to maintain proper tilth and to insure more uniform moisture."

A Modern Herbal

III. Parsley — IV. Sage — V. Rue

By ROBERT BARLOW

III. Parsley

PARSLEY derives its name from the Greek word *petroselinon* or "stone celery". Different from the plants mentioned in the last chapter, it is a member of the large group of umbellifers or umbrella-flowers, to which belong also caraway, carrot, coriander, fennel, celery, celeriac, anise, chervil, lovage, dill, parsnip, and poisonous hemlock. The form of the flower head is unmistakeable. The above list makes it immediately obvious that the umbellifers do their part in supplying volatile oils that may serve as condiments or medicines.

In recent years, the vitamin craze has made some people parsley-conscious since parsley is said to be rich in two important vitamins. I have seen people in restaurants pick up the sprig of parsley which decorated their fish or salad and I enjoyed their pleasure when they discovered that parsley tastes very good when eaten raw. When cooked in beef stock and served with dumplings, it makes a delectable dish. Drunk as tea it works as a diuretic and is said to be effective in cases of arthritis. But those who do not know what parsley can be like should really grow the rooted variety; its leaves are tenderer than the curled form, its taste is superior, and its root has an additional value because it can supply the needed parsley flavor throughout the colder months of the year. Parsley potatoes are a common name on menues, but the favorite dish of many is a soup made of good bones, shankmeat, etc., and about an even proportion of parsley, leek, carrots, and potatoes. I personally like to eat the green leaves with butter and bread for a change from chives. All soups gain by the addition of parsley, especially rice and noodle soups,

Petroselinum sativum

nor is a vegetable soup perfect when parsley is absent; celery or celeriac can by no means replace it.

The old growers who developed our present herbs for the kitchen garden were wise in that they distinguished between the fine flavors of many different, though closely related species. We shall soon see

that these taste differences carry with them quite varied medicinal properties. The close observation of the old gardeners and breeders as well as of the herb doctors is actually borne out by modern chemistry.

II Sage

The third great plant family that abounds with herbs is the aster, thistle, basket-flowered group, the composites. It is the largest plant family, existing everywhere in the world, and most likely the latest in plant evolution. Such popular flowers as the sunflower, aster, zinnia are known to everyone; their distinguishing feature is the arrangement of many separate flowerlets in one basket of flowers, which makes not only their flowering period very long and thereby guarantees pollination by the insects, but also brings about a distinctly visible, attractive flower-head on which the insects can alight with ease. One single flowering head produces accordingly an abundance of seeds. But it is not so much the seeds that are used by man as the leaves. While the umbelliferous plants contribute either leaf or root or seed, the composites are grown for their petals or their leaves. The distinct smell of a sunflower leaf or a chrysanthemum leaf is known to every gardener. In the Austrian pharmocopia even the leaves of dandelion, another member of the composite family, are prescribed.

Artemisia vulgaris

Herb plants with basket flowers are, for example, arnica, chamomile, absynth, wormwood, sage, and its many relatives. The *Artemisia* group in this family is represented by dozens of varying species, one of it being wormwood, another sage.

I have often speculated about the first discovery of such important agents as yeast or vinegar, about the utilization of moulds and bacteria in cooking, brewing, dairying long before anyone knew that bacteria or fungi existed. But such discoveries could come by accidents; milk soured, left-over dough was thrown with the newly made bread, and the result would tell. But who was it who discovered first that the seed of one artemisia would expel worms? It was not until the 19th century that Santonin, the active principle, was isolated but for centuries, no doubt thousands of years, it had been used by the medical profession and the layman.

Some plants are, of course, poisonous; we mentioned hemlock in connection with its relative, our fragrant parsley; the composite group is relatively poor in poisonous plants, though many seem to have qualities that repel insect enemies; pyrethrum is just one in point, wormwood another. But undoubtedly many people died in testing plants before the old hunters and shepherds were able to put two and two together: This plant is good for us, this one kills us.

The visitors to Paris or the readers of French novels have come in

contact with absynth, which, taken in overdoses, has the effect of paralysing the nervous system. Who would think that our sage is a very close relative? There are many different sage species, of which I prefer the common mugwort, *Artemisia vulgaris*, especially in dressings of fowl or pork. It has a finer fragrance and a more pungent zippiness than the related sage, which so often is sold in dried and powdered form. One of the readers takes issue with my previous statement that savory should not be used for stuffing, and he distinguishes between sage for dark, savory for white meat. I consider every such suggestion not only worthwhile, but also important; for our tongues and senses of smell and taste are the best chemists in the world. There really is no need for being authoritative about it; for the Latins were right when they said "*De gustibus non est disputandum*" or "You must not argue over different tastes."

V. Rue

In the order of Terebinthine plants are mainly shrubs, trees, and other woody perennials that favor the hotter regions of the globe. They are almost invariably rich in aromatic oils and have fragrant blossoms as well as tasty fruits. The citrus fruits are the most prominent of the order. But the common rue, *Ruta graveolens*, which is a favorite of the herb gardeners all over the world, also belongs to the family. The Swiss pharmacopia prescribes its leaves. Rue tea is bitter and, like many bitter teas, good in cases of colic. Some cooks like to use a pinch of the rue with lamb or pork roast, as though to prevent indigestion by its agency. Our herbalists often mention the rue and this estimation is, no doubt, due to its classical fame in Roman days, its persistence in the mediaeval monasteries, and its acclimation to the Northern farmer's gardens. When the Bavarian farm girl went to hear the sermon on Sunday morning, she usually carried with her a small bouquet that contained a sprig of the rue. It was said that it kept the pious from falling asleep or from getting a headache. Everyone is inclined to laugh at such a simple explanation nowadays. But, lo and behold, modern science comes and searches for new acids and alkaloids with which to treat modern deficiency diseases and nervous disorders. From the rue they derive the agent *Rutin*, which is used in the treatment of some cases of high blood pressure. From the early reports it appears that *Rutin* has exactly the

Ruta graveolens

effect which the Bavarian peasant ascribed to it; it reduces the blood pressure and therefore prevents the blood from penetrating into the fine capillaries with the force that would cause headaches and drowsiness, especially in people accustomed to an active life and not to sitting on a bench on Sunday mornings on a hot summer day.

Even if the cook is not likely to make frequent use of the rue, I should suggest that those fond of cocktails and mint juleps try a slight touch of rue; it would be a wonderful counter-agent to the ef-

fect of alcohol. Is it not remarkable that the "Old Fashioned" drink is so designed as to bring orange or lemon peeling into the human system that exposes itself to cocktail hours? For the agent in citrus fruits is very closely related to *Rutin* and has the same effect on the capillary system. It is quite possible, too, that the astringent effect of some bitters is one reason why bitters help in digestion directly, not only by causing increased flow of digestive juices.

In this conection it should be said that the tuber of celeriac is used by some in place of pineapples when they make summer drinks of a light alcoholic character. I neither condemn nor advocate any practice that does not harm others; but I wish others to ponder the wisdom of certain old recipes and traditions even if all our tastes should differ.

Hydroponics

NEWSWEEK reports in its May 21 issue that the Army grows enormous quantities of fresh vegetables on the remote island of Ascension by means of water cultures, on cinder beds, supplied with water and the necessary chemicals; this method is called hydroponics, and the report says that the experiment is successful from the health point of view. We must remember, of course, that much other food is imported. But it would be interesting to see whether hydroponically grown food is adequate when eaten exclusively without the addition of organically grown grains, meats, etc. Nobody has so far carried out an experiment along those lines.

Kraut Juice For Health

PEDERSON AND FISHER of the New York Experiment Station at Geneva published a bulletin on the various vegetable juices that kill dangerous bacteria; they found the cabbage leaf especially rich in such bactericidal juice; some of the bacteria causing diseases are killed by the fermenting juice as well as by the fresh juice. This throws a new light on the old experience of sailing ships which stocked up heavily on sauerkraut to keep the crew healthy for months without additional fresh vegetables. We like to eat raw cabbage after it has been slightly tamped with a wooden hammer or uncooked sauerkraut served as a relish. Cooking destroys these powers, besides making the sauerkraut harder to digest.

The Healthy Hunzas

By N. P. NORMAN, M. D., and JAMES RORTY

First published in "Junior Red Cross Journal", to whose editor, Mary Louise Fagg, we are obliged for the permit to use the picture of a Hunza, originally printed in Schomberg's "Unknown Karakoram", the above article was revised by Mr. Rorty to include some further information. Organic Gardening readers are acquainted with the Hunzas because this Indian tribe has long been the standard example of health from the soil. The Editor.

IF you look at a fair-sized map of India you will see, about a hundred miles northeast of the Vale of Kashmir, a dot labeled "Hunza." This is the name, not of a town, but of a people and an autonomous principality, ruled by one of India's many pocket potentates.

The Hunzas occupy a seven-mile stretch of fertile land on the north side of the Hunza River, which rises in the Karakoram glaciers and flows north into the Gilgit. Above the Hunzas' wheat fields and terraced apricot and mulberry orchards tower the snow-covered peaks that line the highway leading to the Mintake Pass over the Himalayas into China. For nearly a century soldiers, archaeologists, explorers and mountain climbers have traveled this route, and many have brought back tales of the Hunzas, who, according to all reports, are an extraordinary people. The Hunzas even claim to be descendants of Alexander the Great and his soldiers. This is a fantastic claim, of course, and yet the Hunzas, too, are fair-skinned and their naked bodies are narrow-hipped and deep-chested like the figures of classic Greek sculptures.

British administrators of the Gilgit district reported that the Hunzas were industrious and skillful as farmers and phenomenal as guides and porters for mountain-climbing expeditions. A Hunza, they said, would walk sixty miles to Gilgit, attend to his business there and immediately start back. One of the favorite winter sports of the young men was diving through a hole in the ice of the river, then swimming under water to come up out of another hole, like seals. At their

harvest festivals—though Moslems, the Hunzas are wine makers and wine drinkers—they danced magnificently for hours at a time.

Although surrounded by more numerous tribes, the Hunzas were not attacked, because in the wars

of the past they had always won. In later years, when the British persuaded them to substitute sports for wars, the Hunzas accepted the substitution—and won every competition.

The Hunza brains matched the Hunza physique. "As tillers of the soil," writes a reliable witness, "they are quite in a class apart; as carpenters and masons, as gunsmiths, iron-workers, even as goldsmiths, as engineers for roads, bridges or canals, the Hunzas are outstanding."

Young Dr. McCarrison, surgeon of the Gilgit Agency some forty years ago, noticed that except for an occasional case of inflammation of the eyes caused by the bad ventilation of the Hunza homes in winter, these people almost never needed his services. Yet neighboring tribes were victims of many bodily ills.

Dr. McCarrison thought maybe the Hunzas were so healthy because their diet was better than that of their neighbors.

About this time the importance of diet in building and maintaining human health had been given new emphasis by the investigations of Eijkman and Grijns in the Orient. In 1896 Eijkman, a Dutch Colonial health officer, had proved conclusively that beri-beri in man is caused by the too-exclusive use of polished rice. In 1900, his colleague Grijns, showed that polished rice caused polyneuritis of chickens, that the disease was similar to beriberi in man, and that what was involved was "a deficiency—a partial hunger—a relative lack of certain unknown substances which are easily destroyed, for instance by moist heat, and which are distributed unequally in different articles of food, but cannot be omitted from food without serious harm to the nervous system." In 1910 Casimir Funk gave a name to these "unknown factors" and developed the theory of deficiency disease in his classic "The Vitamins."

When McCarrison read the first edition of Funk's book he had already left the Gilgit agency for the Central Research Institute at Kasuli, where he was trying to find out what caused goitre. If Eijkman, Grijns, and Funk were right, it might be food. But no, when he fed his laboratory pigeons a vitamin-deficient diet they didn't become goitrous. Instead, they began to woble and flounder, exhibiting the familiar symptoms of polyneuritis. Why, McCarrison asked himself, were those Hunzas so healthy when their neighbors were diseased; cheerful, when their neighbors were morose; industrious and self-respecting, when their neighbors were lazy and beggarly?

So little of their land was suitable for farming that they kept no livestock except goats and the food supply was so small that as a rule their people did not even keep dogs. The winter climate was severe, and their housing was primitive. Yet they were extraordinarily strong, handsome and long-lived. Their food consisted of grains—wheat, barley and corn, vegetables and fruit, a certain amount of milk and butter, and goat's meat only on feast days. They grew abundant crops of apricots, which they dried in the sun and used very largely in their diet. In 1921, Dr. McCarrison reported in his "Studies in Deficiency Diseases," that during the seven years of his service at Gilgit, he never saw a case of appendicitis, stomach trouble or cancer. "Among these people the 'abdomen oversensitive' to nerve impressions, to fatigue, anxiety or cold was unknown. . . . Indeed, their buoyant abdominal health has, since my return to the West, provided a remarkable contrast with the dyspep-

tic and colonic lamentations of our highly civilized communities."

In 1927, Dr. McCarrison was appointed director of nutrition research in India, and launched the series of magnificent studies on deficiency diseases and malnutrition which made him famous as a great pioneer in the science of nutrition. What he did was to feed some rats on a diet based on that of the Hunzas, the Sikhs and the Pathans—all robust tribes of the northern border provinces—and others on diets like those of undersized and disease-ridden peoples of the south.

The Hunza rats got whole wheat bread smeared with fresh butter, sprouted peas and beans, fresh raw carrots and cabbage, unboiled whole milk, a small ration of meat with bones once a week, and plenty of water. There were 1,899 of these rats and when they were twenty-seven months old—an age in a rat which corresponds to about fifty-five in a man—they were killed and autopsied. During all their lives, not a single one of the rats had been sick, there had been no death of an adult by natural causes and no infantile mortality. The post-mortem examination showed that all were remarkably free from disease.

Very different was the plight of the 2,243 other rats used in McCarrison's experiments. Like the Hunza rats, they were housed in clean, sunny cages; but they were fed on the diets eaten by the poor people of Bengal and Madras; polished rice, unsprouted peas and beans, other vegetables, condiments and a little milk. Those rats got every kind of disease—pneumonia, sinus infection, enlarged adenoids, stomach ulcer, cancer of the stomach, pernicious anemia, goiter, heart disease and a whole list of other ills.

In another experiment, a colony of rats was fed on the diet of the British working class, which is not unlike the diet of our lower-income city families in the United States. They were given white bread, canned salmon and boiled potatoes, with astonishing results. Whereas the rats fed on the Hunza diet were gentle, playful and even affectionate, the rats fed on the cockney diet not only got sick with various diseases, but developed the most terrible tempers. Soon they began biting their attendants and killing each other.

During these experiments, Victor Heiser, author of "You're the Doctor," visited McCarrison's laboratory and wrote this about what he saw:

"I approached the cage of one of the rats, expecting to find the usual peaceful laboratory animal. What I found was a pinch of fury and hate. As I came near, the rat lunged at me. He was spoiling for a fight. His whiskers bristled and his rough hair stood on end. He was the typical belligerent, touchy, pugnacious, malnourished lower-class Briton. I've met a number of them in London."

Later McCarrison found that by varying the diets of his rats he was able to produce almost to order the diseases of the Indian peoples who eat these diets. Gastric ulcer and duodenal ulcer are very common in Travancore, somewhat less so in Madras. Of the rats fed the Travancore diet, 27.7 per cent developed ulcers; of those fed on the diet of Madras, 11.1 per cent became ulcer victims.

McCarrison's findings went much farther than proving that bad diet might make one susceptible to all kinds of illness. For one thing, they showed that the study of the causes of health and the prevention of disease might be as good a line for

the medical profession to follow as the study of the causes and cure of disease. Moreover, the great British pioneer's work clearly pointed out that something was wrong not merely with the food of the Bengalis, the Madrasis, and the London cockneys, but with the collective way of life, the customs, the social and the political institutions that brought about the production, distribution and consumption of this inadequate, health-destroying food. Also, in contrast, there must be something profoundly right about the Hunza way of life.

There was. For centuries these people have practiced a peculiarly sound, balanced agriculture. Their terraced fields are like those of the pre-Inca peoples of the Andes. The soil of these "staircase" fields is irrigated and renewed by the silt-bearing water brought down by aqueducts from the glaciers of the surrounding mountains which year after year go on grinding mineral supplements for the Hunza farmers. For centuries they have carefully returned to the soil all human, animal and vegetable refuse. Their soil needs no artificial fertilizers, and their crops are not plagued by plant and animal parasites such as those which our own farmers must battle without ceasing.

Diet and Politics

"HISTORY tells of great centers of population which served as the administrative foci of world empires. We cite Athens and Rome. The empires decayed and were conquered by culturally younger people. Sterility and moral and political disintegration are usually cited as the causes. It is reasonable to assume that these deteriorating influences were due to diet, the areas surrounding the great cities having been gradually cropped to death, the plant nutrients including vitamins exhausted by centuries of farming for the inhabitants of the large cities. It is suggestive that these world empires have not been restored or others built around the same locations."—From a Manuscript by L. W. Blau, *Vigor Through Vitamins.*

"Bread" in Name Only

WE HAVE been oblivious of the changes to which our foods have been subjected, because we have retained the old names. We eat "bread", "meat", "butter", "vegetables", and "fruit". Our grandparents ate the same foods; but their bread and their milk were different in substance; only the names have remained the same.—Adapted from *The Slide Rule.*

Useful Pigeons

By W. F. HOLLANDER

EVERYONE has read about Homing pigeons, which carry military messages. And most people have also heard of Pouter pigeons, Fantails, and Tumblers. But these and dozens of other fancy breeds are seldom seen; they are mostly "hot-house flowers" requiring special skill for successful cultivation. The pigeons which I propose to discuss are those happy-go-lucky "commons" or mongrels which fly around many farms and among the skyscrapers and park benches of large cities.

A free-flying flock of several dozen pigeons, given proper housing, requires little attention and can be an asset to a rural home or farm. Roast squabs and pigeon pie, delights of the epicure, can enrich the menu on any country dinner table. These active birds also have an aesthetic value; their bubbling cooing, their clapping wings, and the grace of their flight are likely to be among the cherished memories of home.

HABITS

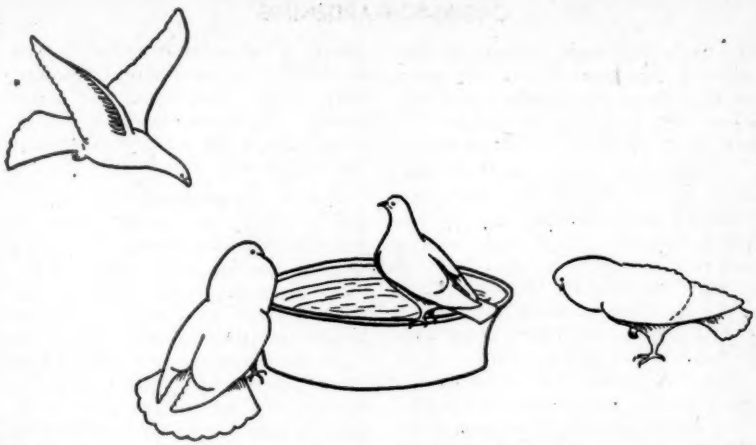
Unlike poultry, pigeons mate in pairs and are generally faithful until death. The males and females look almost alike, but the males betray themselves by their noisy courting, with much cooing, bowing and strutting. The pair selects a supposedly safe nesting place, and then the male brings twigs and straws to the female, who arranges them. After a few days she lays two white eggs. Both male and female incubate the eggs in alternation, the female having the night shift. Hatching occurs in two and a half weeks if all goes well. The baby squabs are helpless golden-downed infants. The parents feed them by regurgitation; first comes "pigeon milk", a special curdy secretion of the crop, and after a week or so regular feed is given. By the end of a month after hatching the squeakers, as the squabs are called, should be as large as the parents, and ready to learn to fly.

Meanwhile the parents usually start a new nest elsewhere, and are incubating another pair of eggs. These breeding cycles continue as long as the weather is not too severe and provided food is obtainable. Depending upon locality and conditions, up to 16 squabs may be raised by the average pair in a year.

The most critical period in most pigeons' lives is weaning. They must learn to fly, to find food and water, and to avoid all sorts of new dangers; and they must learn within a very few days. It is not surprising that not many survive except in the best seasons.

Hawks often ravage pigeon flocks. To escape, pigeons will often dash headlong into the shelter of a cave, tree, or sometimes even down a chimney. A small flock may be massacred, but a large flock is more durable.

Large flocks of pigeons have an extraordinary attraction for strays.



This "magnetism" is known to breeders as the flock pull. But a flock can only remain large if it has adequate and congenial roosting and nesting conditions.

If the owner provides food for the birds, they are only too willing to accept. Otherwise they will forage far and wide. Seeds of great variety, and bits of tender green buds and leaves are the staples. The birds are industrious gleaners in grainfields. Unless enormous flocks are developed, the birds are harmless to crops and gardens.

During the breeding season the birds generally crave salt and lime. A pile of salt in an exposed piece of ground makes a "salt lick" that will endure for years and attract piegons from miles away. Crushed oyster shell strewn nearby will also be popular.

Pigeons are naturally cleanly in their habits, and are usually free of lice or mites. Bathing in water is especially enjoyed; one's fish pool or stock-watering trough is likely to be covered periodically with a whitish film from the powder in the birds' feathers. This is perhaps unsightly for a few hours, but harmless.

In the northern states and perhaps others, winter is a difficult period for the birds, not because of the cold but because of the lack of food at times. Water is usually obtainable from a stream or lake, or the birds will eat snow. But there are times that an owner should provide grain to tide them over.

THE START

Starting with pigeons is likely to be the only difficulty. It is essential that a home be arranged for them that they will love and consider a haven. A barn loft is greatly to their liking, but unless it is ratproofed and unlikely to be invaded by other unwelcome visitors such as cats, snakes, and raiding boys, it is doomed to failure. If the loft can be properly safeguarded it may be ideal. A window or door lets the birds fly in and out; this may be shut at night if one should desire to confine or catch the birds for some reason (e. g., pigeon pie). In the loft one should arrange nesting places on the floor against the walls, and on shelves with cleats, or by means of boxes. A number of narrow shelves and poles are desirable for roosting. One may calculate that each pigeon is likely to require one nesting site and two feet of roost.

Another housing system which

the birds find very acceptable but which is less accessible to the owner, is to hang nest boxes under the eaves of a barn, preferably on the side most protected from storms.

If pigeons already visit the buildings, they will usually adopt the facilities one provides, but the development of a flock may take a couple of years. The alternative is to purchase the nucleus of a flock and keep them confined and fed for a few weeks until they have forgotten their previous home. The better they like the accommodations at the new home, the faster they forget the old. Plucking three of the outer large wing feathers of one wing helps discourage a pigeon from extensive flying when first permitted freedom at the new home. Even for a while after the birds have learned their new location it is desirable to continue to provide some feed and water. Wheat and corn scattered on the ground near the barn will coax them to begin foraging.

CULINARY NOTES

When the squabs are about full-size but not quite ready to fly, they should be in prime condition, ready for the kitchen. They may be killed by dislocating the neck; this method is simple and avoids getting blood over everything. Scalding is not necessary but if quickly done it assists in picking. Dressing is similar to that for chickens, but one need not search for a gall-bladder—pigeons have none. The dressed weight of common squabs normally averages 7 ounces or better.

Most common squabs have a dark skin color, sometimes like that of Concord grapes. This color is perfectly normal, even though not considered attractive. Fancy market squabs are light-skinned because the selected breeds kept for this purpose on special farms are white or of related color that is hereditarily incapable of developing dark skin. But even the light-skinned varieties have no white meat; under the surface all squabs and pigeons have red flesh.

Recipes for preparation of squabs and pigeons are to be found in many cook books. Pressure-cooking is desirable for adult pigeons, because they may take hours to become tender by simple steaming. When the meat readily separates from the bones, one can proceed to make pigeon pie. Squabs may be pressure-cooked briefly before roasting but they are so tender that this is not necessary.

PIGEON COMPOST

Nests no longer occupied by squabs are ordinarily a solid fairly dry mass that can be readily lifted out of the nest box. It is desirable though not necessary to remove such nests about once a month from the loft or nest tiers. The loft floor may be cleaned also at intervals, and a light layer of straw or other litter put down. Pigeon manure is highly prized by horticulturists, in many countries. In some parts of Europe a preferred composting method is to bury it in a pit or trench for about a year before use. For orchard use in this country however it seems to be effective when spread fresh on top of the ground.

In concluding this treatise on one of man's oldest feathered associates, one might say that in this country pigeons have not been given much consideration for the role that they play best: gleaning. Rather they have more often been put into an unnatural competition with poultry. Perhaps it will be better seen now that the competition is unfair, and that in a diversified agriculture pigeons have their own useful, though modest, place.

Over the Fence

by H. K. MEYER

Willard Hollander knows his pigeons, as his drawing shows. His grandfather was a bishop, his father is a well-known linguist at Texas University, the translator of the Edda and some Scaldic poetry originating in Norway and Iceland; Willard, who is happily married, is now with the Carnegie Institution.

•

The Cooperative angle comes up again: C. E. Murphy of the Ohio Farm Bureau points out in the *News* that fertilizer costs went down immediately when Ohio farmers began to cooperate. Note the Index prices.

	1921	1944
Fertilizers	186	121
Farm Machinery	159	174

•

Did you know that spruce needles contain often twice as much vitamin C as oranges? If you ever chewed on them, you probably noticed that they had an orangy flavor too. But iris leaves have twelve times as much of this vitamin.

•

How much compost should be used? I believe that the gardener can never produce too much. All he has to consider is this: Keep some for the crops that want a good topdressing shortly before the time they get ready to shoot up and produce flowers: Beans, tomatoes, cucumbers, pumpkins, cantaloupes, eggplants, peppers.

•

A. S. Kirkpatrick from Albuquerque, N. M., writes that he thinks a farm can pay real dividends by raising health food and advertising it as organically raised. That is a splendid idea, we think.

•

The books say that bees go from one flower to the next without mixing the different kinds; they graze first one species, then the next for pollen or nectar. I have often seen them mix their species. But I did not know how many flowers a bee visits on one trip. Warren Whitcomb figured it out and arrived at the startling number of over 200 flowers. This means that a colony visits in one year around 500,000,000 flowers; half a billion of flowering plants depend on one colony of bees for their seed.

•

Carlton Fredericks of New York City who has a wide audience among gardeners recommended ORGANIC GARDENING over the air. Thanks, Carlton!

OUR OWN BOOK CLUB is doing fine; we wish we could open up more memberships or include the material in the magazine; but the technical aspects of paper rationing are in the way; we have a small amount of paper for books, which cannot be used for the magazine; our 12-books-a-year-at $3.00-system is the only method open: In this way the small book paper quota will serve the greatest number of readers.

•

Calvin Byers, writer of the splendid column "A Farmer's Diary", of Mansfield, Ohio, has joined our subscriber list. When I read and answer letters from all parts of the country, I am constantly amazed how much of a cross-section of American life we represent; farmers, gardeners, young and old men, girls, housewives, leaders of garden clubs, ministers, writers, lawyers, professors, doctors, school boys, and officials. We answer every letter we receive, but we cannot print a fiftieth of them.

•

The U. S. Department of Agriculture put out those splendid yearbooks. One is called *Soils and Men.* In it two leading scientists, Dr. McMurtrey and Mr. W. O. Robinson deal with trace minerals and forgotten soil problems. Listen to this: "The commercial fertilizers applied to obtain larger yields are for the most part comparatively pure salts, which through the phenomenon of base exchange (Note: *Return to the Land II*: *The pH Question* in our May number) tend to displace secondary elements in the soil and cause them to be used by growing crops or carried away in the drainage water. These commercial fertilizers are different from farm manure in that they do not ordinarily contain enough of the secondary elements to be of any significance."

•

OUR OWN BOOK CLUB is pushing out new leaves; the next booklet will be *Leaves and How They Work.* It is profusely illustrated with photos and original drawings from the pen of Doris Clark. There are articles on leaf shapes, woolly, waxy, shiny, meat-eating, colored leaves; on leaf drop, the autumn leaf, the work of leaves, the origin of leaves, leaf pests, edible leaves, and a score more of such questions. It will be a pretty comprehensive encyclopedia on leaves. We hope that some copies remain for the readers who have not joined the Club. For, even if I say so myself, the booklet is worth its price at least five times.

•

Organic Gardening just expanded its library to house the ever-increasing number of research books. We have hundreds of volumes on the various phases of gardening and agriculture; numerous books on rocks, minerals, fertilizers, chemistry; an almost complete collection on soil biology, bacteriology, and organics; again hundreds of volumes on all branches of botany, evolution of plants, plant geography and ecology, and especially plant physiology, the science of what happens when plants grow.

Hints For The Victory Gardener

This is the thirty-second of a series of articles by this author dealing with the cultivation of ordinary vegetables.

SORREL

By ROGER W. SMITH

IF you make a careful selection at planting time, your Victory garden can bring back to you many almost forgotten plant friends. Perhaps you grow a short row of sorrel. It flourishes and something about its halbred-shaped leaves seems familiar. You pick one, taste it, and instantly you remember the time when you were very, very young and when, on a hot, dry day you chewed sour-grass leaves to quench your thirst.

Sorrel is the cultivated form of sour-grass. It is a perennial, commonly grown from seed. It belongs to that extensive genus *Rumex* which includes many wild herbs. Wild sorrel is often called dock-spinach but it is distinguished from the docks by the shape of its leaves.

Several kinds of wild sorrel—sour-grass—have been developed by thoughtful gardeners during times long past. It is likely that from the wild *Rumex acetosa,*—sour-grass—also common in Western Europe, these gardeners created the cultivated, narrow-leafed sorrel. From *Rumex scutatus,* a native of Southern Europe, the large-leafed or French sorrel was probably developed.

Closely related to these forms is the *Rumex abyssinicus* or spinach-rhubarb grown in Abyssinia. This plant frequently reaches a height of nine feet with leaves seven inches long. The stalk is used there much like asparagus and the leaves are much in demand as "greens".

Although wild sorrel is well known as a herb, its cultivated form is all too little grown in our Victory gardens. This valuable vegetable is very easy to grow. It requires only a deep, mellow, well-drained soil containing its normal quota of organic humus. A heavy application of mature compost humus or well-rotted manure dug in lightly at planting time will usually render even poor soil ideal.

For the formation of fine, edible leaves steady, rapid growth is necessary. For this the plant demands much nitrogen and easily assimilated plant food. This is provided by the added organic humus and normal rains.

When the area has been properly prepared, the rows should be marked off about fourteen inches apart and the seed sown one quarter of an inch deep. Since it is a perennial, the best time for sowing the seed is during the latter part of August or early in September. Seed

should be thinly sown since the plants are to stand about four inches apart in the row.

When cold weather settles over your garden you will find it best to mulch your short row of sorrel with a three to four inch layer of rough grass, weeds, hay, or similar substance, although sorrel is very hardy.

In the Spring this covering should be removed and a top dressing of sifted compost humus applied. Almost before you know it

Sorrel (Rumex acetosa)

the sorrel leaves will be forming, for sorrel is one of the very earliest of spring greens.

During midsummer drought, or when growing in poor soil, sorrel tends to produce slowly-formed, excessively tart leaves, much like the leaves of its wild ancestor. However, although the cutting of leaves during the summer months is not recommended, plants rooted in soil abundantly supplied with organic humus usually have a heavy reserve of moisture upon which to draw. The period over which they are able to form fine leaves is considerably extended.

By cutting the leaves only when they are well formed you will find that the plants will continue to supply fine, edible material for several years. Cutting should be done mostly during Spring and Fall at which times the plants will be growing very vigorously. During these periods you will reap a heavy harvest.

A fairly heavy mulch of roughly composted material applied in the late Fall is almost certain to cause a heavy crop of leaves early the following Spring. If you gather leaves carefully, keep down weeds by mulch or hoe—and mulching is much to be preferred—a short row of sorrel may well last several years. However, if you make a small new planting every other year you will be sure of harvesting only fine, young leaves for you will be in a position to discard all old plants.

Perhaps your curiosity will get the better of you and you will boil a pot full of the leaves, using only a little water. You discover the flavor to be decided tart—as if there had been combined the freshness of early green rhubarb with the more mature acidity of ripe lemons. Truly a surprisingly refreshing flavor from so humble a plant. But when you remember the pleasure derived from the chewing of the little leaves of the wild sorrel, you will easily realize the value of the cultivated form. It is especially in demand as a flavoring for soups and stews and for adding an essential piquancy to many kinds of greens.

And after you have grown and tasted this plain garden vegetable, so close to its wild state yet that it is practically immune from insect

attack and plant disease, you will wonder about it. You remember its giant, Abyssinian form. What might be done by introducing this form to the garden, and perhaps crossing it with smaller varieties? A little seed, a short row of sorrel can start much speculation. One ounce of seed of either the Large-leafed French sorrel or the Narrow-leafed kind is enough to plant about one hundred feet of row. Both kinds mature sufficiently so that cuttings can usually be made about sixty-five days after sowing the seed.

A short row of sorrel. Perhaps it will bring back to you the flavor of sunshiny days long since fled; perhaps you will transplant a few wild sorrel plants and set them among their more cultured descendants for comparison. You may be sure that in whatever direction your interest carries you, you will find the growing of this humble plant well worth while.

Poison Ivy

EVERY gardener has suffered from it at one time or another; the sensible remedy would be complete eradication of the plant in winter or spring; but we are usually afraid of the burns we receive and mean to be careful until we get the poison on our skin after all.

Few people are immune to poison oak, poison ivy, poison sumach, because our organism does not develop antibodies against picric acid, catechol, and similar organic poisons to which poison ivy belongs. Treating the hands immediately with strong soda, ordinary baking or washing soda, will help, but not completely.

We feel that this rapidly spreading weed should be eradicated from our roadsides and fields, either by applying the new hormone sprays, such as *Weedone* or by drenching the infested parts with borax. Five pounds of borax for a space of about 5 by 5 ft. (or 10 by 10 of leaf surface) will soon kill the cause of so much suffering and irritation. This is a case of poison against poison!

Tomatoes

TOMATOES can be made to bear extensively by being mulched with organic mulches; they can stand pretty strong amounts of top-dressing even with half decayed compost or manure. Where fruits are grown for making tomato juice, the quantity is more important than the size, and it is therefore *not advisable to prick out* too many twigs. Various varieties can be treated differently and the experienced gardener knows instinctively how far he should go in forcing his vines to bear extra fruit. Marglobe especially should not be pricked, but others like Rutgers, also do better when allowed to grow naturally.

Reader's Correspondence

Send stamped self-addressed envelope for reply.

FARM AND ORCHARD COMPOSTING

Q. I have an orchard of some 560 trees including Pecans, Deciduous and Citrus fruits. To make Compost for these would seem a big undertaking. If I plant, grow and plow or disc in the soil two or three crops a year of green manure such as cow peas or some other legume will this be nearly equal to the Compost method?

In what way is Compost superior to the green manure plan here mentioned?

You are very generous to give people information contained in your answers to letters and I thank you very much.

Claud McCauley,
Pearsall, Texas.

A. Green manure crops, such as you mention, are only suitable substitutes to composting on a large scale especially if you use them at first as a mulch leaving them to wither on the ground as a cover. This method is also called sheet composting; in time you may find it profitable first to balance the plant food in the compost heap and to supply it in immediately available form to your orchard.

The difference between sheet composting, green manuring, and finished compost is this: The biologic action has to take place in the ground which may deprive the trees of some nourishment for part of the time, while the compost applies the finished product without taxing the orchard soil.

It may seem like a big proposition when composting is advocated for a large commercial orchard or farm; but there are available right now in a price range of about $150-$500.00 a number of mechanical devices that could make composting easy enough. We mention for example:

John Deere Manure Loader,

The Hydraulic Farm Hand, Superior Separator Co., 1179 15th Ave., Minneapolis, Minn.

Tractor Power Fork and Shovel, G. and D. Manufacturing Co., Streator, Ill.

Horn-Draulic Loaders, Horn Mfg. Co., Fort Dodge, Iowa.

Super Six Hydro-lift, Super Six Sales Co., Minneapolis, Minn.

Ottawa Farmer, Ottawa Steel Products, Inc., Ottawa, Kansas.

Possibly some Hayloaders can be utilized too, for instance, the

Haymaster Stacker-Loader, New Method Equipment Co., Indianola, Iowa. This company also manufactures *Workmaster Manure Scoop;* then there are the *Gunco Loaders and Stackers,* made by the Gunning, Inc., Frankfort, Indiana. They are tractor mounted and advertised both for power and speediness.

The Coals Co., Ft. Dodge, Iowa, the Caswell Manufacturing Co., Cherokee, Iowa, the King-Wyse Mfg. Co., Elmira, Ohio, and others make similar equipment.

Since these machines can also be used for loading alfalfa and hay, they should be especially helpful for utilizing cover crops in an orchard.

GREENHOUSE VEGETABLES

Q. I am tired of eating dead vegetables loaded with poisons through the winter months. I am planning to place a green house on the east side of my home. I shall cut two doors in the basement wall where I now have two windows. *The green house will be ground level,* the soil naturally will consist of composted materials, under the growing soil I shall put fresh manure, this manure shall generate heat as is done in hot beds. I shall remove the insulation from the piping of my hot water heater in the basement, but do not intend to run pipes into the green house. The green house will be about 20 feet by 15 feet. In other words I should have with this arrangement a combination hot bed and green house. I think that it will work and am *willing to take the risk, surely it cannot fail altogether. What do you think of the idea?*

Can you give me the names of firms who could furnish sectional green houses that one could buy, and then put up in the manner as I have outlined above?

Another question which I would like to be enlightened upon, namely; Do vegetables raised under glass have the same food value that those do which are raised out in the open air and sunshine? I think not but am not sure. Or will glass that allows the ultra violet rays to penetrate grow nutritionally complete foods?

A. Heinrichsmeyer,
St. Louis, Mo.

A. We think your idea with the green house is splendid and it probably will not be necessary to run piping through the house. You might address yourself to Lord and Burnham Co., Des Plaines, Illinois or to Foley Green House Mfg. Co., 8900 Van Buren, Forest Park, Illi-

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P. O. Box 288 El Monte, Calif.

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ORGANIC GARDENING may not always reach you when expected, but it will come to you in the end. Sometimes, paper is not delivered in time; sometimes, inexperienced help is used in the mailing rooms; when a minor difficulty develops in one of the many machines used in putting out a magazine, it may take a day or two to get the needed repair done; with peace time conditions approaching, we hope to keep these delays at a minimum; for the time being and until new equipment can be installed, please be patient and give us at least one week of grace. Sometimes, two delays come together and ORGANIC GARDENING may be late by two weeks. We hope not, but we also hope that it is worth waiting for.

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nois, to National Green House Mfg. Co., Plano, Illinois or to Dayton Green House Mfg. Co., Dayton, Ohio.

All of these should be able to assist you with your problem and submit plans and specifications. The Organic Farm has had a green house for some time now and raises splendid food. While the absence of ultra violet rays may reduce the formation of the sunshine vitamin, you can always get enough of the latter by putting in a good amount of such vegetables as carrots and parsnips grown in the open and easily stored through the winter.

—o—

LEAVES IN MAINE

Q. This is not a commercial farm, but a home place, with a home garden, plenty of flowers, shrubs and trees mostly oak, with a sprinkling of maples, hickory, elm, birch, beech, linden, ash, etc.

I have tried to make compost of leaves. With grass clippings and layers of soil in between but it takes two years and two or three turnovers to get it so it can be put through a rough screen for use, in fact you wear yourself out before you do the leaves. So I haul off tons of leaves to the shore and burn them. If there is a short cut to utilize this product in a normal way I would try it as an experiment. I hope *Organic Gardening* will help me.

Arthur S. Bosworth,
Cape Elizabeth, Maine.

A. Organic Gardening methods will certainly cut down on the time required for composting. For the leaves, under Maine conditions, we advise liberal sprinklings of lime such as can be had at the seed stores. But without manure, you

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will find composting difficult unless you substitute other matter rich in nitrogen such as blood meal, cottonseed meal, etc. The bacterial action necessary for breaking down organic matter requires the presence of such materials, otherwise the process is too slow because there is too much carbon material and too little nitrogen which serves the bacteria in building up their own bodies. Of course, it is also necessary that you supply bacteria, but that you probably get through the layers of soil. The Sir Albert Howard method should give you good compost quickly.

—o—

SHADE TREES

Q. I have received my April O. G. and you hit the nail on the head in your article "The Organic Forest." That Black Walnut trees do injure the crops and soil around them can be seen anytime on my place. Chestnut trees just die if put too close and we are thinking seriously of cutting these two Black Walnut trees down. They are seedling planted 27 years ago. Fine large trees. Beautiful and wonderful shade but, the damage to the soil and plants is outweighing the benefit of shade and beauty. *What tree could one plant that would grow fast and be nice large trees?*

Mrs. Doris Juttner,
Corvallis, Ore.

A. I always hate to cut down a large tree, and I can understand your feeling. What I would do in your place is plant some other trees in another spot, let them come up, and then reconsider cutting down the Black Walnut trees. Most fast growing trees are of the soft wood variety belonging to the poplar and tallow kind. Besides the Siberian Elm, the Chinese Tallow is prob-

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ably the fastest growing tree, and birds love it to such an extent that it is not always easy to use it for a shade tree. That, of course is one advantage with the nuts.

—o—

PEAR BLIGHT

Q. In the April issue of Organic Gardening I read your article on chestnut blight. Can you offer any explanation for the cure of pear blight. I have limed my orchard with ground limestone, blossom blight is very destructive in some seasons.

Asa Kelley,
Fordsville, Ky.

A. The question of pear blight is still unsolved, but it is definitely connected with the nutrition of the pear tree. Healthy trees can be saved if the infected tips are cut out. From all indications and reports from organic gardeners, the best cure would be heavy mulching and the supply of organic material in the form of compost. If that were generally done the pears could, probably, again be grown all over the United States.

—o—

CITY COMPOSTING

Q. Would it be objectionable in any way to me or the neighbors if I attempted to construct a compost heap in my yard?

Can dog manure be used in the compost heap as the manure element?

In using kitchen waste or green matter which I may accumulate should I save it on the side until I have enough to construct a compost heap according to your instructions or should I add to the